REMARKS

Claims 44-53 are pending in the instant application, and are subject to restriction. Claim 44 has been amended to correct a typographical error, and new claims 54-79 have been added. Accordingly, claims 44-79 will remain pending upon entry of the instant amendment.

Support for the addition of claims 54-79 can be found throughout the specification and claims as originally filed. In particular, support can be found at least, for example, in claims 1-18, 21, 22 and 25 as originally filed, and in the specification at least, for example, at page 8, line 21 through page 9, line 2. No new matter has been added.

Attached hereto as Appendix A is a marked-up version of amended claim 44 to show the changes made. For the Examiner's convenience, attached hereto as Appendix B is the set of all claims that will be pending upon entry of the instant claim amendments and additions.

Restriction Requirement

The Office Action, on page 2, requires restriction to one of the following groups under 35 U.S.C. §121:

Group I: claim 44 , drawn to method of selecting inhibitors of an autoinducer, classified in class 435, subclass 41;

Group II: claim 45, drawn to method of selecting synergists of an autoinducer, classified in class 435, subclass 41;

Group III: claims 46-47, drawn to culture medium, classified in class 435, subclass 325; and

Group IV: claims 48-53 , drawn to methods of regulating gene expression, classified in class 435, subclass 45.

Applicants are required to elect one of the above groups for prosecution on the merits. Applicants respectfully traverse the requirements for restriction and election, and submit that the requirements are improper.

First, Applicants assert that the subject matter of these groups represent different embodiments of a single inventive concept for which a single patent should issue. The pending claims represent an intricate web of knowledge, continuity of effort, and consequences of a single invention, which merit examination of all of these claims in a single application. More particularly, all the claims are linked by a single, searchable, unifying aspect; *i.e.*, autoinducer molecules of *Pseudomonas aeruginosa*.

Second, Applicants submit that a sufficient search and examination with respect to the subject matter of all claims can be made without serious burden. As the M.P.E.P. states:

> If the search and examination of an entire application can be made without serious burden, the examiner must examine it on the merits, even though it includes claims to independent or distinct inventions.
>
> M.P.E.P. § 803 (7th ed., Rel. 78A, March 1999).

That is, even if the above-enumerated groups of claims are drawn to distinct inventions, the Examiner must still examine the entire application on the merits because doing so will not result in a serious burden.

Applicants submit that the search and examination of all the claims will have substantial overlap, and no serious burden will result from searching and examining all claims in the same application. This is especially true inasmuch as Groups I-IV are all classified in class 435. In fact, Groups I and II have ***exactly the same classification***; *i.e.*, class 435, subclass 41. Therefore, the statement in the Office Action at page 3, second full paragraph, to the effect that the "groups have acquired a separate status in the art" is not accurate. Indeed, if the groups had acquired a separate status in the art, the Patent Office would not have classified them in the same class. Given the identity of classification and the powerful computer-based search engines and data bases at the Examiner's disposal, Applicants submit that no serious burden will result from searching and examining all claims in the same application.

Therefore, in the interest of savings of time and cost to Applicants and the Patent Office, Applicants respectfully request that all the claims be searched and examined in a single

application. At a minimum, Applicants request that Groups I and II be rejoined into a single group.

Nevertheless, in compliance with the directives in the Office Action and in order to expedite prosecution of the instant application, Applicants hereby elect, subject to the foregoing traverse, Group I, claim 44, drawn to method of selecting inhibitors of an autoinducer. New claims 54-79 read on the elected invention.

If a telephone conversation with Applicants' attorney would help expedite the prosecution of the above-identified application, the Examiner is urged to call the undersigned attorney at (617) 227-7400.

Respectfully submitted,

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Date: September 13, 2002

APPENDIX A

MARKED-UP VERSION TO SHOW CHANGES MADE

44. (Amended) A method of selecting inhibitors of [the]an autoinducer molecule of *Pseudomonas aeruginosa* comprising:

contacting the autoinducer molecule with a suspected inhibitor;

measuring the ability of the treated autoinducer molecule to stimulate the activity of a selected gene;

determining whether the suspected inhibitor inhibits the ability of the autoinducer molecule to stimulate the activity of a selected gene; and

selecting the suspected inhibitors that inhibit the autoinducer molecule.

APPENDIX B

44. (Amended) A method of selecting inhibitors of an autoinducer molecule of *Pseudomonas aeruginosa* comprising:

contacting the autoinducer molecule with a suspected inhibitor;

measuring the ability of the treated autoinducer molecule to stimulate the activity of a selected gene;

determining whether the suspected inhibitor inhibits the ability of the autoinducer molecule to stimulate the activity of a selected gene; and

selecting the suspected inhibitors that inhibit the autoinducer molecule.

45. A method of selecting synergists of the autoinducer molecule of *Pseudomonas aeruginosa* comprising:

contacting the autoinducer molecule with a suspected synergist;

measuring the ability of the treated autoinducer molecule to stimulate the activity of a selected gene;

determining whether the suspected synergist enhances the ability of the autoinducer molecule to stimulate the activity of a selected gene; and

selecting the suspected synergists that enhance the activity of the autoinducer molecule.

46. A culture medium containing as an added compound N-(3-oxododecanoyl)homoserine lactone at a concentration effective to stimulate or promote cellular metabolism, growth, or recovery.

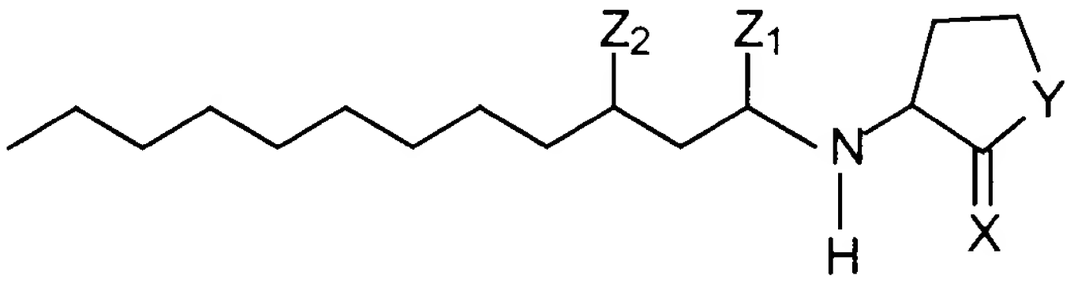
47. The culture medium of claim 46 wherein the cellular growth of *Pseudomonas aeruginosa* is stimulated or enhanced.

48. A method of regulating the expression of a gene comprising:

inserting a gene into bacteria chosen for enhancement of gene expression by an agent that enhances the activity of the LasR protein; and

incubating the bacteria with an agent that enhances the activity of the LasR protein such that the expression of the gene is regulated.

49. The method of claim 48, wherein the agent is a compound of the following formula:



wherein Y is O, S, or NH; X is O, S, or NH; and Z_1 and Z_2 are independently selected from the group consisting of hydrogen =O, =S, and =NH; the molecule being able to regulate gene expression.

50. The method of claim 48, wherein the agent is N-(3-oxododecanoyl) homoserine lactone.

51. The method of claim 48 wherein the method further comprises the additional steps of:

allowing the gene expression to reach a desired level; and

incubating the bacteria with an agent that inhibits the activity of the LasR protein regulating the gene expression by the bacteria.

52. A method of regulating the expression of a gene comprising:

inserting a gene into a cell chosen for enhancement of gene expression by N-(3-oxododecanoyl)homoserine lactone; and

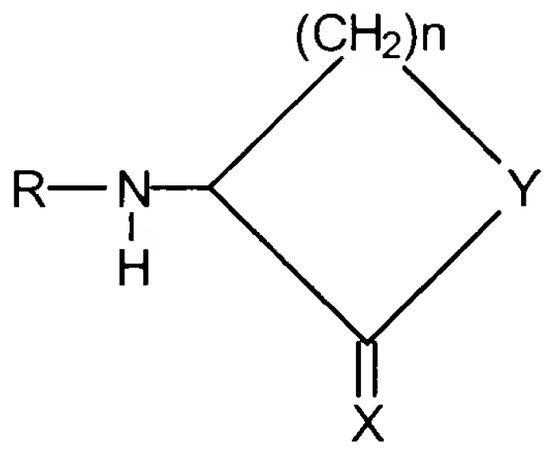
incubating the cell with N-(3-oxododecanoyl)homoserine lactone such that the expression of the gene is regulated.

53. The method of claim 52 wherein the method further comprises the additional steps of:

allowing the gene expression to reach a desired level; and

incubating the cell with an agent that inhibits the activity N-(3-oxododecanoyl)homoserine lactone regulating the gene expression by the cell.

54. (New) The method of claim 44, wherein the autoinducer molecule comprises a molecule of the formula I:



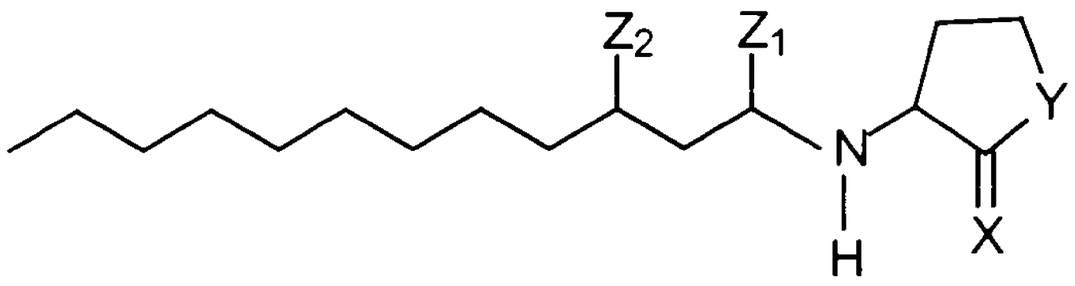
wherein n is 2 or 3; Y is O, S, or NH; X is O, S, or NH; and R is a fatty hydrocarbon or acyl moiety that may be substituted or a moiety having at least seven members containing a ring structure that may be substituted, wherein the molecule is able to stimulate the activity of the selected gene of *Pseudomonas aeruginosa*.

55. (New) The method of claim 54 wherein R is a C_7 - C_{14} acyl moiety.

56. (New) The method of claim 55 wherein R is a C_{10} or higher acyl moiety.

57. (New) The method of claim 56 wherein R is a C_{12} acyl moiety.

58. (New) The method of claim 57, wherein the autoinducer molecule comprises a molecule of the formula II:



wherein X is O, S, or NH; Y is O; and Z_1 and Z_2 are independently selected from the group consisting of hydrogen, =O, =S, and =NH.

59. (New) The method of claim 44, wherein the autoinducer molecule is N-(3-oxododecanoyl)homoserine lactone.

60. (New) The method of claim 54 wherein R contains a heterocyclic ring structure.

61. (New) The method of claim 60 wherein the heterocyclic ring structure has five to seven ring members.

62. (New) The method of claim 61 wherein the heterocyclic ring structure contains oxygen.

63. (New) The method of claim 54 wherein R contains a carbocyclic ring structure.

64. (New) The method of claim 63 wherein the carbocyclic ring structure is a fused ring system.

65. (New) The method of claim 54 wherein the molecule is purified from its native source.

66. (New) The method of claim 65 wherein the native source is the culture media of *Pseudomonas aeruginosa*.

67. (New) The method of claim 54 wherein the molecule is synthesized by chemical means.

68. (New) The method of claim 54 wherein the molecule is an optically active isomer.

69. (New) The method of claim 68 wherein the isomer is the L-isomer.

70. (New) The method of claim 68 wherein the isomer is the D-isomer.

71. (New) The method of claim 44, wherein the selected gene is the *lasR* gene.

72. (New) The method of claim 71, wherein the *lasR* gene encodes a protein selected from the group of transcriptional activator proteins of *Pseudomonas aeruginosa*.

73. (New) The method of claim 72, wherein the transcriptional activator protein is the LasR protein.

74. (New) The method of claim 44, wherein the step of contacting the autoinducer molecule with the suspected inhibitor further comprises combining the autoinducer molecule and the suspected inhibitor with *E. coli* MG4.

75. (New) The method of claim 74, wherein the step of measuring the ability of the treated autoinducer molecule to stimulate the activity of the selected gene comprises measuring the amount of β-galactosidase produced as a result of combining the autoinducer molecule and the suspected inhibitor with *E. coli* MG4.

76. (New) The method of claim 75, wherein the step of determining whether the suspected inhibitor inhibits the ability of the autoinducer molecule to stimulate the activity of the selected gene comprises comparing the amount of β-galactosidase produced to a standard to determine if the suspected inhibitor represses the ability of the autoinducer to stimulate the production of β-galactosidase.

77. (New) An inhibitor of an autoinducer molecule of *Pseudomonas aeruginosa*, wherein the inhibitor is selected by the method of claim 44.

78. (New) The inhibitor of claim 77, wherein the inhibitor is an analog of N-(3-oxododecanoyl)homoserine lactone.

79. (New) The inhibitor of claim 78, wherein the analog is an antagonist of the LasR protein of *Pseudomonas aeruginosa*.